



# Australian Bureau of Statistics

## **3238.0.55.001 - Estimates of Aboriginal and Torres Strait Islander Australians, June 2011**

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## Summary

### Main Features

#### NOTES

#### ABOUT THIS RELEASE

This product contains final estimates of the Aboriginal and Torres Strait Islander, non-Indigenous and total populations of Australia at 30 June 2011, for various geographies.

Estimates are disaggregated by age (5-year age groups, with some single year of age data available) and sex for state and territory, Remoteness Areas and Indigenous Regions. Only total estimates for Statistical Areas Level 2 are available.

The estimates of the Aboriginal and Torres Strait Islander and non-Indigenous populations presented in this publication are based on 2011 Census of Population and Housing counts adjusted for net undercount as measured by the Post Enumeration Survey. The extent of undercoverage of Aboriginal and Torres Strait Islander Australians in the 2011 Census and the relatively small sample size of the Post Enumeration Survey to adjust for that undercoverage means the estimates should be interpreted with a degree of caution.

Description of the methods used to produce the estimates are contained in the technical note in this product.

Single year of age population estimates for Aboriginal and Torres Strait Islander peoples for 30 June 2011 should be used with caution. The estimates are subject to errors that cannot be comprehensively adjusted for within the population estimates compilation process, given the limited ability to estimate Census undercount by Indigenous status and other demographic characteristics. Features present in single year of age Census counts may be likely to appear in population estimates even after adjustments for undercount and other factors have been applied. The ABS recommends that five year age groups should be used in preference to single year of age data wherever possible, particularly for states and territories with relatively small Aboriginal and Torres Strait Islander populations.

#### INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070.

#### SUMMARY COMMENTARY

#### ESTIMATES OF ABORIGINAL AND TORRES STRAIT ISLANDER AUSTRALIANS

This publication presents the final population estimates of Aboriginal and Torres Strait Islander Australians as at 30 June 2011. They replace the preliminary estimates released on 27 September 2012 in Australian Demographic Statistics, March Quarter 2012 (cat. no. 3101.0). Details of the methodology used in calculating these estimates are provided in Technical Note: Estimated Resident Aboriginal and Torres

## Strait Islander Population - Method of Calculation.

The final estimated resident Aboriginal and Torres Strait Islander population of Australia as at 30 June 2011 was 669,900 people, or 3% of the total Australian population. This population estimate represents a large increase in the Aboriginal and Torres Strait Islander population estimates from the estimate of 517 000 for 30 June 2006. This change will be explored in the upcoming publication Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts Between 2006 and 2011 (cat. no. 2077.0).

Of the states and territories, the largest populations of Aboriginal and Torres Strait Islander Australians lived in New South Wales (208,500 people) and Queensland (189,000 people). The smallest population of Aboriginal and Torres Strait Islander Australians lived in The Australian Capital Territory (6,200 people).

Aboriginal and Torres Strait Islander Australians comprised 30% of the population of the Northern Territory, the highest proportion of any state or territory.

### Estimated resident population, Indigenous status, 30 June 2011

|                | Estimated resident population            |      |                | Median age                               |                |
|----------------|--|------|----------------|--|----------------|
|                | Aboriginal and/or Torres Strait Islander |      | Non-Indigenous | Aboriginal and/or Torres Strait Islander | Non-Indigenous |
|                | no.                                      | %    | no.            | years                                    | years          |
| <b>Males</b>   |  |      |                |  |                |
| NSW            | 103 907                                  | 2.9  | 3 481 202      | 20.6                                     | 37.2           |
| Vic.           | 23 543                                   | 0.9  | 2 717 416      | 21.1                                     | 36.3           |
| Qld            | 94 082                                   | 4.2  | 2 139 877      | 20.2                                     | 36.5           |
| SA             | 18 554                                   | 2.3  | 793 291        | 21.5                                     | 38.8           |
| WA             | 43 731                                   | 3.7  | 1 141 319      | 22.0                                     | 36.1           |
| Tas.           | 12 076                                   | 4.7  | 242 714        | 20.9                                     | 40.5           |
| NT             | 34 479                                   | 28.4 | 87 004         | 23.0                                     | 35.0           |
| ACT            | 3 181                                    | 1.7  | 179 815        | 21.5                                     | 33.9           |
| Aust.(a)       | 333 683                                  | 3.0  | 10 784 551     | 21.1                                     | 36.8           |
| <b>Females</b> |  |      |                |  |                |
| NSW            | 104 569                                  | 2.9  | 3 528 851      | 22.2                                     | 38.9           |
| Vic.           | 23 790                                   | 0.9  | 2 773 068      | 22.2                                     | 38.2           |
| Qld            | 94 872                                   | 4.2  | 2 147 947      | 21.7                                     | 37.8           |
| SA             | 18 854                                   | 2.3  | 808 915        | 23.1                                     | 40.9           |
| WA             | 44 539                                   | 3.8  | 1 123 820      | 22.9                                     | 37.5           |
| Tas.           | 12 089                                   | 4.7  | 244 604        | 22.5                                     | 42.1           |
| NT             | 34 371                                   | 31.3 | 75 438         | 24.5                                     | 34.5           |
| ACT            | 2 979                                    | 1.6  | 182 010        | 22.8                                     | 35.5           |
| Aust.(a)       | 336 198                                  | 3.0  | 10 885 592     | 22.5                                     | 38.5           |
| <b>Persons</b> |  |      |                |  |                |
| NSW            | 208 476                                  | 2.9  | 7 010 053      | 21.4                                     | 38.0           |
| Vic.           | 47 333                                   | 0.9  | 5 490 484      | 21.7                                     | 37.3           |
| Qld            | 188 954                                  | 4.2  | 4 287 824      | 21.0                                     | 37.2           |
| SA             | 37 408                                   | 2.3  | 1 602 206      | 22.3                                     | 39.8           |
| WA             | 88 270                                   | 3.8  | 2 265 139      | 22.4                                     | 36.8           |
| Tas.           | 24 165                                   | 4.7  | 487 318        | 21.7                                     | 41.3           |
| NT             | 68 850                                   | 29.8 | 162 442        | 23.8                                     | 34.8           |
| ACT            | 6 160                                    | 1.7  | 361 825        | 22.1                                     | 34.7           |
| Aust.(a)       | 669 881                                  | 3.0  | 21 670 143     | 21.8                                     | 37.6           |

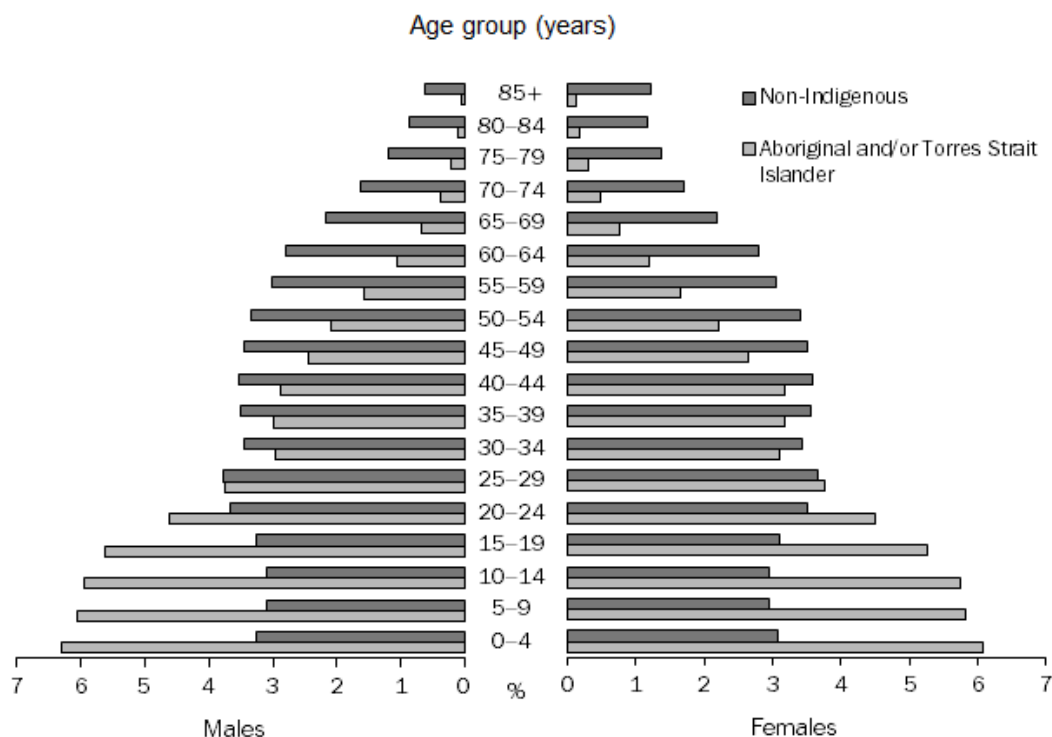
(a) Includes Other Territories.

## Age structure

The Aboriginal and Torres Strait Islander population at 30 June 2011 had a younger age structure than the non-Indigenous population, with larger proportions of young people and smaller proportions of older people. The median age of the Aboriginal and Torres Strait Islander population at 30 June 2011 was 21.8

years, compared to 37.6 years for the non-Indigenous population.

#### ABORIGINAL AND TORRES STRAIT ISLANDER AND NON-INDIGENOUS POPULATION - 30 JUNE 2011



#### Indigenous Status (individual categories)

Among the Aboriginal and Torres Strait Islander population in 2011, 90% of people (606,200 people) identified as being of Aboriginal origin only, 6% (38,100) were of Torres Strait Islander origin only, and 4% (25,600) were of both Aboriginal and Torres Strait Islander origin.

#### Estimated resident population, Indigenous status, 30 June 2011

|          | Aboriginal only<br>no. | Torres Strait<br>Islander only<br>no. | Both Aboriginal and Torres<br>Strait Islander<br>no. | Total Aboriginal and/or Torres<br>Strait Islander<br>no. | Non-<br>Indigenous<br>no. | Total<br>no. |
|----------|------------------------|---------------------------------------|--|--|---------------------------|--------------|
| NSW      | 198 920                | 5 723                                 | 3 833  | 208 476  | 7 010 053                 | 7 218 529    |
| Vic.     | 43 644                 | 2 636                                 | 1 053  | 47 333   | 5 490 484                 | 5 537 817    |
| Qld      | 149 072                | 24 386                                | 15 496   | 188 954  | 4 287 824                 | 4 476 778    |
| SA       | 35 483                 | 1 253                                 | 672  | 37 408   | 1 602 206                 | 1 639 614    |
| WA       | 84 971                 | 1 667                                 | 1 632  | 88 270   | 2 265 139                 | 2 353 409    |
| Tas.     | 21 869                 | 1 428                                 | 868  | 24 165   | 487 318                   | 511 483      |
| NT       | 66 150                 | 830                                   | 1 870  | 68 850   | 162 442                   | 231 292      |
| ACT      | 5 799                  | 206                                   | 155  | 6 160  | 361 825                   | 367 985      |
| Aust.(a) | 606 164                | 38 134                                | 25 583   | 669 881  | 21 670 143                | 22 340 024   |

(a) Includes Other Territories.

#### Remoteness Areas

At 30 June 2011, around one-third of all Aboriginal and Torres Strait Islander people lived in Major Cities of

Australia (233,100 people). A further 147,700 people lived in Inner Regional Australia and 146,100 people in Outer Regional Australia. The remainder lived in Remote Australia (51,300 people) or Very Remote Australia (91,600 people).

### **Estimated resident Aboriginal and Torres Strait Islander population, Remoteness Areas, 30 June 2011**

| <b>Remoteness Areas</b> | <b>Aboriginal and Torres Strait Islander<br/>%</b> | <b>Non-Indigenous<br/>%</b> | <b>Total<br/>%</b> |
|-------------------------|--|-----------------------------|--------------------|
| Major City Areas        | 34.8   | 71.3                        | 70.2               |
| Inner Regional          | 22.0   | 18.3                        | 18.4               |
| Outer Regional          | 21.8   | 8.7                         | 9.1                |
| Remote                  | 7.7  | 1.2                         | 1.4                |
| Very Remote             | 13.7   | 0.5                         | 0.9                |

## **About this Release**

Contains final estimates of the Aboriginal and Torres Strait Islander, non-Indigenous and total populations of Australia at 30 June 2011, based on the 2011 Census of Population and Housing, for various geographies.

Estimates are disaggregated by age (5-year age groups) and sex for state and territory, Remoteness Areas and Indigenous Regions. Estimates for SA2s (not disaggregated by age groups and sex) will also be available.

## **History of Changes**

**This document was added or updated on 16/10/2013.**

### **15/11/2013**

Addition of a datacube containing Aboriginal and Torres Strait Islander population estimates for Statistical Local Areas and Local Government Areas (ASGC 2011) - 30 June 2011.

### **16/10/2013**

Addition of a 'Total' row and footnote to datacube: Estimated resident Aboriginal and Torres Strait Islander population, Northern Territory, with and without adjustment for age heaping - 30 June 2011.

# **Explanatory Notes**

## **Explanatory Notes**

### **EXPLANATORY NOTES**

### **INTRODUCTION**

**1** This publication contains final estimates of the Aboriginal and Torres Strait Islander, non-Indigenous and total populations of Australia at 30 June 2011, based on results of the 2011 Census of Population and Housing.

**2** Estimates are disaggregated by age and sex for states/territories, Remoteness Areas and Indigenous Regions. Only total estimates for Statistical Areas Level 2 are available.

## ESTIMATED RESIDENT POPULATION

**3** Estimated resident population (ERP) is the official measure of the population of Australia, based on the concept of usual residence within Australia. Usual residence is that place where each person has lived or intends to live for six months or more from the reference date for data collection.

**4** The estimates of the Aboriginal and Torres Strait Islander population presented in this publication are based on 2011 Census of Population and Housing counts of Aboriginal and Torres Strait Islander Australians, adjusted for net undercount as measured by the Post Enumeration Survey. The extent of undercoverage of Aboriginal and Torres Strait Islander Australians in the 2011 Census and the relatively small sample size of the Post Enumeration Survey to adjust for that undercoverage means the estimates should be interpreted with a degree of caution. For more information on data quality see the relevant section of this Explanatory Note and Technical Note: Estimated Aboriginal and Torres Strait Islander Australian Resident Population - Method of Calculation.

## INDIGENOUS STATUS

**5** The Aboriginal and Torres Strait Islander population of Australia comprises people who are of Aboriginal origin, Torres Strait Islander origin or both Aboriginal and Torres Strait Islander origin. The Commonwealth definition of an Aboriginal and/or Torres Strait Islander person is:

- a person of Aboriginal or Torres Strait Islander descent who;
- identifies as being of Aboriginal or Torres Strait Islander origin and who is;
- accepted as such by the community with which the person associates.

**6** The 2011 Census of Population and Housing (Household Form) asked the following question of each person:

|  |  |
|--|--|
| <b>7</b> Is the person of Aboriginal or Torres Strait Islander origin?<br>• For persons of both Aboriginal and Torres Strait Islander origin, mark both 'Yes' boxes. | <input type="radio"/> No<br><input type="radio"/> Yes, Aboriginal<br><input type="radio"/> Yes, Torres Strait Islander |
|--|--|

## METHOD OF ESTIMATION

**7** Estimated resident populations by Indigenous status are compiled using Census, Post Enumeration Survey (PES) and other demographic information. Starting with Census counts by place of usual residence, a number of steps are involved. These include:

- Imputation of Indigenous status for Census records with unknown Indigenous status (as a result of either non-response to the Aboriginal and Torres Strait Islander origin question in the Census, or unknown Indigenous status on Census records imputed by the Australian Bureau of Statistics (ABS) when a form could not be obtained from occupied dwellings identified in the field);
- An allowance for net Census undercount: in a complex exercise such as the Census, it is inevitable that some people will be missed and some will be included more than once. The PES, conducted shortly after Census night, collects information about where people were on Census night and their characteristics to estimate net Census undercount;
- An estimate of the number of Australian residents temporarily overseas at the time of the Census;
- Backdating from the Census date of 9 August 2011 to the ERP reference date of 30 June 2011 using data on births, deaths, and interstate and overseas migration for the intervening period;
- Minor demographic adjustments designed to address any anomalies in age and sex composition.

**8** For further information, see Technical Note: Estimated Resident Aboriginal and Torres Strait Islander Australian Population - Method of Calculation.

## **DATA QUALITY**

### **Census**

**9** The ABS aims to produce high quality data from the Census. To achieve this, extensive effort is put into Census form design, collection procedures, and processing procedures. There are four principle sources of error in Census data: partial response, processing error, respondent error and undercount.

**10** Partial response: When completing their Census form, some people do not answer all the questions which apply to them. While questions of a sensitive nature are generally excluded from the Census, all topics have a level of non-response. However, this level can be measured and is generally low. In those instances where a householder fails to answer a question, a not stated code is allocated during processing, with the exception of non-response to age, sex, marital status and place of usual residence. These variables are needed for population estimates, so they are imputed using other information on the Census form, as well as aggregate data from the previous Census.

**11** Processing error: The processing of information from Census forms is mostly automated, using scanning, Intelligent Character Recognition and other automatic processes. Quality assurance procedures are used during Census processing to ensure processing errors are kept at an acceptable level. Sample checking is undertaken during coding operations, and corrections are made where necessary.

**12** Respondent error: The Census form may be completed by one household member on behalf of others. Incorrect answers can be introduced to the Census form if the respondent does not understand the question or does not know the correct information about other household members. Many of these errors remain in the final data.

**13** Undercount: The goal of the Census is to obtain a complete measure of the number and characteristics of people in Australia on Census night and their dwellings, but it is inevitable that a small number of people will be missed, some will be counted more than once and some will not be identified correctly. In Australia, more people are missed from the Census than are counted more than once. The net effect when both factors are taken into account is an undercount.

**14** Each of these sources of error are particularly relevant to, and have the potential to significantly impact on, the Census counts of Aboriginal and Torres Strait Islander Australians.

**15** Further information on Census data quality is available in Census Dictionary, 2011 (cat. no. 2901.0) and 2011 Census Data Quality Working Papers, available on the ABS web site [www.abs.gov.au/census](http://www.abs.gov.au/census).

### **The Post Enumeration Survey (PES), sampling error and undercount**

**16** Due to the uncertainty in Aboriginal and Torres Strait Islander Census counts as well as the estimation of net undercount of the Aboriginal and Torres Strait Islander population, estimates presented in this product should be interpreted with a degree of caution.

**17** The ABS conducts the PES shortly after the Census to determine how many people were missed in the Census and how many were counted more than once. The design of the survey is such that estimates of net undercount are suitable for augmenting Census counts for the purpose of deriving population estimates for Australia and the states and territories. For 2011, the survey had a sample size of around 43,000 households across Australia.

**18** As estimates of undercount are based on a sample survey they are subject to sampling error. Since only a sample of dwellings is included in the PES, estimates derived from the survey may differ from figures which would have been obtained if all dwellings had been included in the survey. One measure of the likely difference is given by the standard error (SE) which indicates the extent to which an estimate might have varied by chance because only a sample was included. The relative standard error (RSE) is the standard error expressed as a percentage of the estimate to which it refers.

**19** For Australia, the direct estimate of the Aboriginal and Torres Strait Islander population obtained from

the PES was 662,300 persons, with a standard error of 14,300 (and a relative standard error (RSE) of 2.2%). For estimating the Aboriginal and Torres Strait Islander population of states and territories, undercount estimates were adjusted to improve the reliability of estimates. For more information on the method applied, see Technical Note: Estimated Resident Aboriginal and Torres Strait Islander Australian Population - Method of Calculation. Unadjusted undercount rates are presented below but should be used for illustrative purposes only. The adjusted estimates which were actually used in the calculation of final Aboriginal and Torres Strait Islander population estimates and which should be used can be found in Technical Note: Estimated Resident Aboriginal and Torres Strait Islander Australian Population - Method of Calculation.

## 20

### Unadjusted PES undercount estimates, states and territories - 2011(a)

|                              | Net undercount<br>no. | SE<br>no. | Net undercount rate<br>% | SE<br>% |
|------------------------------|-----------------------|-----------|--------------------------|---------|
| New South Wales              | 26 388                | 9 132     | 13.3                     | 4.0     |
| Victoria                     | 12 395                | 4 781     | 24.6                     | 7.2     |
| Queensland                   | 34 815                | 8 231     | 18.3                     | 3.5     |
| South Australia              | 6 852                 | 1 977     | 18.4                     | 4.3     |
| Western Australia            | 17 340                | 4 493     | 19.9                     | 4.1     |
| Tasmania                     | 5 140                 | 1 632     | 20.8                     | 5.2     |
| Northern Territory           | 11 043                | 2 053     | 16.3                     | 2.5     |
| Australian Capital Territory | 216                   | 775       | 4.0                      | 13.8    |

(a) For illustrative purposes only. See Explanatory Note 19.

**21** The PES sample is insufficient to produce estimates of net undercount by Indigenous status at the sub-state/territory level. Undercount was therefore apportioned to Statistical Areas Level 2 based on age, sex, Indigenous status and state/territory. For further information on this process, please refer to Regional Population Growth, Australia, 2011 (cat. no. 3218.0)

**22** It is important to note that at the sub-state/territory level, differences between Census counts and estimates of the Aboriginal and Torres Strait Islander population should not be interpreted as a definitive measure of the actual level of undercount; rather, these differences are a by-product of the assumptions that contribute to the estimation process, and the differences should be considered indicative, based on the best available (though limited) information.

**23** For further information see Technical Note: Estimated Resident Aboriginal and Torres Strait Islander Australian Population - Method of Calculation.

**24** For further information on the Post Enumeration Survey see Census of Population and Housing - Details of Undercount, 2011 (cat. no. 2940.0).

## AUSTRALIAN STATISTICAL AREAS

**25** This publication contains data coded to a number of statistical geographic structures within the statistical geography classification called the Australian Statistical Geography Standard (ASGS). The structures used are: the Main Structure, the Remoteness Structure and the Indigenous Structure.

**26** Users should note that the Australian Statistical Geography Standard (ASGS) became effective in July 2011. It replaces the previously used Australian Standard Geographical classification (ASGC) and differs in the fact that the ASGS is more stable, the regions are more consistent in population size, are designed to give the maximum geographical detail for a range of published data, and represent underlying settlement patterns and socio-economic relationships. Information on the new standard is available on the ABS website under 'Statistical Geography'. Alternatively, see Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2011 (cat. no. 1270.0.55.001).

### Australian Standard Geographical Structure - Main Structure

**27** The ABS Structures are a hierarchy of regions developed for the release of particular ABS statistics.

Their components are described below:

- Mesh Blocks (MBs): are the smallest geographical region in the ASGS. There are approximately 347,000 covering the whole of Australia. They broadly identify land use such as: residential, commercial, agriculture and parks etc. Mesh Blocks are very small and are the building blocks for all the larger regions of the ASGS. Only limited Census data (total population and dwelling counts) are released at the Mesh Block level.
- Statistical Areas Level 1 (SA1s): have been designed as the smallest unit for the release of Census data. SA1s generally have a population of 200 to 800 persons, and an average population of about 400 persons. They are built from whole Mesh Blocks and there are approximately 55,000 SA1s covering the whole of Australia.
- Statistical Areas Level 2 (SA2s): are a general-purpose medium sized area built from whole SA1s. Their aim is to represent a community that interacts together socially and economically. SA2s generally have a population range of 3,000 to 25,000 persons, and have an average population of about 10,000 persons. The SA2 is the lowest level of the ASGS structure for which Estimated Resident Population (ERP), Health and Vitals and other non-Census ABS data are generally available. There are about 2,200 SA2s covering the whole of Australia.
- Statistical Areas Level 3 (SA3s): provide a standardised regional breakup of Australia. The aim of SA3s is to create a standard framework for the analysis of ABS data at the regional level through clustering groups of SA2s that have similar regional characteristics. SA3s are built from whole SA2s and in general have populations between 30,000 to 130,000. They are often the functional areas of regional cities and large urban transport and service hubs.
- Statistical Areas Level 4 (SA4s): are the largest sub-State regions in the Main Structure. They are designed for the output of Labour Force Survey data and reflect labour markets within each state and territory. SA4s are built from whole SA3s and cover the whole of Australia. There are 88 SA4s.

**28** For the purposes of this publication, Jervis Bay Territory, Christmas Island and Cocos (Keeling) Islands are collectively referred to as 'Other Territories' and are included in the totals for Australia.

**29** For further information see Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2011 (cat. no. 1270.0.55.001).

## **Remoteness Structure**

**30** The purpose of the Remoteness Structure is to divide Australia into broad geographic regions that share common characteristics of remoteness for statistical purposes. The Remoteness Structure divides each state and territory into several regions on the basis of their relative access to services. Remoteness Areas (RAs) are the spatial units that make up the ASGS Remoteness Structure. There are six classes of RA in the Remoteness Structure: Major Cities of Australia, Inner Regional Australia, Outer Regional Australia, Remote Australia, Very Remote Australia and Migratory.

**31** Within each state/territory, each RA represents an aggregation of non-contiguous geographical areas which share common characteristics of remoteness (constructed from SA1s). While statistical data classed to this structure may be available by state/territory, characteristics of remoteness are determined in the context of Australia as a whole. Therefore, not all RAs are represented in each state/territory.

**32** For further information see Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure, July 2011 (cat. no. 1270.0.55.005).

## **Indigenous Geography Structure**

**33** Data are also presented according to the Indigenous Structure of the Australian Statistical Geography Standard (ASGS). Under this classification, areas are defined as follows:

- Indigenous Locations (ILOCs): are aggregates of one or more SA1s. ILOCs generally represent small Aboriginal and Torres Strait Islander communities with a minimum population of 90 Aboriginal and Torres Strait Islander usual residents. An ILOC is an area designed to allow the production of Census statistics relating to Aboriginal and Torres Strait Islander people with a high level of spatial accuracy while maintaining the confidentiality of individuals. For the 2011 Census, 1116 ILOCs have been defined to cover the whole of geographic Australia.



- Indigenous Areas (IAREs): are medium sized geographical units designed to facilitate the release of more detailed statistics. IAREs provide a balance between spatial resolution and increased granularity of attribute data. They are created by aggregating one or more ILOCs. For the 2011 Census, 429 IAREs are defined to cover the whole of geographic Australia.
- Indigenous Regions (IREGs): are large geographical units loosely based on the former Aboriginal and Torres Strait Islander Commission boundaries. They are created by aggregating one or more IAREs. The greater population of IREGs enables the highest level of granularity of attribute data through greater cross classification of variables compared with IAREs and ILOCs. For the 2011 Census 57 IREGs are defined to cover the whole of geographic Australia. IREGs do not cross state or territory borders.

**34** For further information see Australian Statistical Geography Standard (ASGS): Volume 2 - Indigenous Structure, July 2011 (cat. no. 1270.0.55.002).

## CONFIDENTIALITY

**35** The **Census and Statistics Act, 1905** provides the authority for the ABS to collect statistical information, and requires that statistical output shall not be published or disseminated in a manner that is likely to enable the identification of a particular person or organisation. This requirement means that the ABS must take care that identifiable information about individual respondents cannot be derived from published data.

**36** To protect confidentiality within this publication, some small cell values have been suppressed.

**37** In addition, some Remoteness Areas in the states and territories have been combined to protect confidentiality. In Victoria, Outer Regional Australia and Remote Australia have been combined to produce Rest of Victoria. In Tasmania, Remote Australia, and Very Remote Australia have been combined to produce Rest of Tasmania. Remoteness Areas are not available for the ACT in this product.

## FURTHER INFORMATION

### Related publications and references

**38** Other ABS publications that may be of interest to users of this publication include:

- Australian Demographic Statistics (cat. no. 3101.0)
- Australian Historical Population Statistics (cat. no. 3105.0.65.001)
- Births, Australia (cat. no. 3301.0)
- Census Dictionary, 2011 (cat. no. 2901.0)
- Census of Population and Housing - Counts of Aboriginal and Torres Strait Islander Australians, 2011 (cat. no. 2075.0)
- Census of Population and Housing - Details of Undercount, 2011 (cat. no. 2940.0)
- Deaths, Australia (cat. no. 3302.0)
- Demography Working Paper 2001/4 - Issues in Estimating the Indigenous Population, 2001 (cat. no. 3126.0)
- Experimental Life Tables for Aboriginal and Torres Strait Islander Australians, 2005-2007 (cat. no. 3302.0.55.003)
- Experimental Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 1991 to 2021 (cat. no. 3238.0)
- Occasional Paper: Population Issues, Indigenous Australians, 1996 (cat. no. 4708.0)
- The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples, Oct 2010 (cat. no. 4704.0)
- Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts Between 2006 and 2011 (cat. no. 2077.0) (to be released on 17 September, 2013)

**39** Current publications and other products released by the ABS are listed on the ABS web site [www.abs.gov.au](http://www.abs.gov.au).

**40** As well as the statistics included in this and related publications, additional information is available from

the ABS web site at [www.abs.gov.au](http://www.abs.gov.au) and accessing Themes/Demography.

## Glossary

### GLOSSARY

#### Census

The complete enumeration of a population or groups at a point in time with respect to well-defined characteristics (eg Population, Manufacturing, etc.). When the word is capitalised, "Census" usually refers to the national Census of Population and Housing.

#### Dwelling

A dwelling is a structure which is intended to have people live in it, and which is habitable on Census Night. Some examples of dwellings are houses, motels, flats, caravans, prisons, tents, humpies and houseboats.

There are private and non-private dwellings:

- A private dwelling is normally a house, flat, part of a house, or even a room; but can also be a house attached to, or rooms above, shops or offices; an occupied caravan or unit in a caravan park or craft in a marina; occupied dwelling in a Manufactured Home Estate; occupied self-care unit in Accommodation for the Retired or Aged; a houseboat; or tent if it is standing on its own block of land. An occupied caravan situated on a residential allotment is also classed as a private dwelling. Private dwellings can be either occupied or unoccupied.
- Non-private dwellings are those dwellings not included above, which provide a communal or transitory type of accommodation. They are classified according to their function. These dwellings include hotels, motels, guest houses, prisons, religious and charitable institutions, defence establishments, hospitals and other communal dwellings. Only occupied non-private dwellings are included in the Census.

#### Estimated resident population (ERP)

The official measure of the population of Australia, based on the concept of usual residence. It refers to all people, regardless of nationality or citizenship, who usually live in Australia, with the exception of foreign diplomatic personnel and their families. It includes usual residents who are overseas for less than 12 months out of a continuous 16 month period. It excludes overseas visitors who are in Australia for less than 12 months out of a continuous 16 month period.

#### Indigenous status

Indigenous Status indicates whether a person identifies as being of Aboriginal and/or Torres Strait Islander origin. Indigenous status is reported (either by an individual or a person responding to a survey or Census on their behalf) in response to the question: Is the person of Aboriginal and/or Torres Strait Islander origin?

#### Median age

For any distribution the median value is that which divides the relevant population into two equal parts, half falling below the value, and half exceeding it. Thus, the median age is the age at which half the population is older and half is younger.

#### Net undercount

The difference between the actual Census count (including imputations) and an estimate of the number of people who should have been counted in the Census. This estimate is based on the PES conducted after each Census. For a category of person (e.g. based on age, sex and state of usual residence), net undercount is the result of Census undercount, overcount, misclassification and imputation error.

## **Post Enumeration Survey**

The Census Post Enumeration Survey (PES) is a household survey conducted three to four weeks after the Census. The PES allows the ABS to estimate the number of people missed in the Census and the number counted more than once. Usually more people are missed than counted more than once in Australia, leading to a net undercount.

## **Relative Standard Error (RSE)**

The relative standard error is the standard error expressed as a percentage of the estimate to which it refers, and is useful when comparing the variability of estimates of different sizes.

## **Standard Error (SE)**

A measure of the variation among the estimates from all possible samples, and thus a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. The units of the standard error are the same as the variable of interest.

## **Statistical Areas Level 2**

Statistical Areas Level 2 are a general-purpose medium sized area built from whole SA1s. Their aim is to represent a community that interacts together socially and economically. SA2s generally have a population range of 3,000 to 25,000 persons, and have an average population of about 10,000 persons. The SA2 is the lowest level of the ASGS structure for which Estimated Resident Population (ERP), Health and Vitals and other non-Census ABS data are generally available. There are about 2,200 SA2s covering the whole of Australia. For information, see Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2011 (cat no. 1270.0.55.001).

## **Statistical Areas Level 3**

Statistical Areas Level 3 provide a standardised regional breakup of Australia. The aim of SA3s is to create a standard framework for the analysis of ABS data at the regional level through clustering groups of SA2s that have similar regional characteristics. SA3s are built from whole SA2s and in general have populations between 30,000 to 130,000. They are often the functional areas of regional cities and large urban transport and service hubs. For information, see Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2011 (cat no. 1270.0.55.001).

## **Statistical Areas Level 4**

Statistical Areas Level 4 are the largest sub-State regions. They are designed for the output of Labour Force Survey data and reflect labour markets within each state and territory within the population limits imposed by the Labour Force Survey sample. SA4s provide the best sub-state socio-economic breakdown in the ASGS. SA4s are built from whole SA3s and cover the whole of Australia. There are 88 SA4s. For information, see Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2011 (cat no. 1270.0.55.001).

# **Abbreviations**

## **ABBREVIATIONS**

|       |   |
|-------|---|
| ABS   | Australian Bureau of Statistics           |
| ACT   | Australian Capital Territory              |
| ASGS  | Australian Statistical Geography Standard |
| Aust. | Australia                                 |
| ERP   | estimated resident population             |
| IARE  | Indigenous Area                           |
| ILOC  | Indigenous Location                       |
| IREG  | Indigenous Region                         |
| NSW   | New South Wales                           |

|      |                          |
|------|--------------------------|
| NT   | Northern Territory       |
| PES  | Post Enumeration Survey  |
| Qld  | Queensland               |
| RA   | Remoteness Area          |
| RSE  | relative standard error  |
| S/T  | state or territory       |
| SA   | South Australia          |
| SA1  | Statistical Area Level 1 |
| SA2  | Statistical Area Level 2 |
| SA3  | Statistical Area Level 3 |
| SA4  | Statistical Area Level 4 |
| SE   | standard error           |
| Tas. | Tasmania                 |
| Vic. | Victoria                 |
| WA   | Western Australia        |

## Quality Declaration - Summary

### QUALITY DECLARATION SUMMARY

#### INSTITUTIONAL ENVIRONMENT

For information on the institutional environment of the Australian Bureau of Statistics (ABS), including the legislative obligations of the ABS, financing and governance arrangements, and mechanisms for scrutiny of ABS operations, please see ABS Institutional Environment.

#### RELEVANCE

This publication contains final estimates of the Aboriginal and Torres Strait Islander, non-Indigenous and total populations of Australia at 30 June 2011, based on results of the 2011 Census of Population and Housing. Estimates are disaggregated by age and sex for Australia, states/territories, Remoteness Areas and Indigenous Regions. Only total estimates for Statistical Areas Level 2 are available.

#### TIMELINESS

Estimates of the Indigenous and non-Indigenous populations are produced for 30 June of each Census year. Preliminary estimates for 30 June 2011 were released on 27 September 2012 in Australian Demographic Statistics, March Quarter 2012 (cat. no. 3101.0).

Final estimates for 30 June 2011 were released on 30 August 2013 in Estimates of Aboriginal and Torres Strait Islander Australians (cat. no. 3238.0.55.001).

A time series of estimates of the Indigenous population, based on estimates from the most recent Census, are produced once every five years. Estimates for the period 2001 to 2026 are scheduled for release in April 2014 in **Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026** (cat. no. 3238.0).

#### ACCURACY

The estimates presented in this publication are based on results of the 2011 Census of Population and Housing, adjusted for net undercount as measured by the Post Enumeration Survey.

The goal of the Census is to obtain a complete measure of the number and characteristics of people in Australia on Census night and their dwellings. To achieve this, extensive effort is put into Census form design, collection procedures, and processing procedures. For further information on sources of error in the Census, see the Explanatory Notes.

In a large and complex exercise such as the Census, it is inevitable that a small number of people will be missed and some will be counted more than once. In Australia, more people are missed from the Census than are counted more than once. The net effect when both factors are taken into account is net undercount.

The ABS conducts the Post Enumeration Survey shortly after the Census to determine how many people were missed in the Census and how many were counted more than once. For 2011, the net undercount of the Indigenous population was 114 200 persons.

There were 1 059 000 Census records (4.9% of the total Census count) with unknown Indigenous status in the 2011 Census. For the purposes of population estimates, these records are allocated to either Indigenous or non-Indigenous according to other demographic characteristics from the Census. For a detailed discussion of unknown Indigenous status in the 2011 Census see *Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts Between 2001 and 2011* (cat. no. 2077.0), to be released on 17 September 2013.

The extent of undercoverage of Aboriginal and Torres Strait Islander Australians in the 2011 Census and the relatively small sample size of the Post Enumeration Survey to adjust for that undercoverage means the estimates should be interpreted with caution.

For more information see Technical Note: Estimated Aboriginal and Torres Strait Islander Australian Resident Population – Method of Calculation.

## COHERENCE

The estimates presented in this publication are not consistent with, and should not be compared with, estimates based on 2006 or other Censuses, for a number of reasons including:

- changes in Census collection methodologies over time, and in particular, in the Indigenous Enumeration Strategy used in the Census – see *Interpreting The Data in Population Distribution, Aboriginal and Torres Strait Islander Australians, 2006* (cat. no. 4705.0);
- unexplained growth in the Indigenous population between Censuses – see *Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts between 2006 and 2011* (cat. no. 2077.0) to be released on 17 September 2013; and
- changes in methodology and scope of the Post Enumeration Survey over time – for more information on the PES, see *Census of Population and Housing - Details of Undercount, 2011* (cat. no. 2940.0).

Estimates of the Indigenous population for the period 2001 to 2026, based on the 2011 estimates presented in this publication, are scheduled for release in April 2014 in **Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026** (cat. no. 3238.0).

## INTERPRETABILITY

This publication contains detailed Explanatory Notes, two Technical Notes and Glossary that provide information on the data sources, terminology, classifications and other technical aspects associated with these statistics.

## ACCESSIBILITY

Estimates of the Aboriginal and Torres Strait Islander and non-Indigenous populations of Australia are available on the ABS website under the 3238.0.55.001 product family, as:

- Main Features, which contains summary commentary; and
- data cubes (in Microsoft Excel spreadsheet format).

If the information you require is not available as a standard product, then the ABS Information Consultancy Service can help you with customised services to suit your needs. The ABS observes strict confidentiality protocols as required by the Census and Statistics Act 1905. This may limit access to data at a very detailed level. For inquiries contact the National Information and Referral Service on 1300 135 070 or email [client.services@abs.gov.au](mailto:client.services@abs.gov.au).

# Estimated Resident Aboriginal and Torres Strait Islander Population – Method of Calculation (Technical Note)

## TECHNICAL NOTE 1 ESTIMATED RESIDENT ABORIGINAL AND TORRES STRAIT ISLANDER POPULATION – METHOD OF CALCULATION

### INTRODUCTION

**1** This technical note outlines the method by which the Australian Bureau of Statistics (ABS) used data from the 2011 Census of Population and Housing and Census Post Enumeration Survey (PES) to produce final rebased estimates of the Aboriginal and Torres Strait Islander population for 30 June 2011.

### THE CENSUS POST ENUMERATION SURVEY

**2** While every effort is made to ensure full coverage of people and dwellings in Australia in the Census, small numbers of people will inevitably have been missed while others will have been counted more than once. In Australia more people are missed from the Census than are counted more than once. The net effect of overcount and undercount is called net undercount.

**3** To measure net undercount of the Australian population, the ABS conducts the PES shortly after the Census. The PES is a sample survey that provides an independent check of Census coverage. In 2011, the survey had a sample of around 43,000 dwellings (with approximately 97,000 responding persons). In PES processing, the survey information from the PES dwelling is matched against corresponding Census forms for either the same Census dwelling, or for a dwelling nominated by the PES respondent as a likely address they would have been enumerated at, to determine whether each resident of the PES dwelling was counted in the Census. The PES also provides information about the consistency of data across the two collections.

**4** The 2011 PES introduced several methodological changes including expanding the sample and to include more discrete Indigenous communities and over sampling in urban and regional areas with a high proportion of Aboriginal and Torres Strait Islander residents. Another significant change was the implementation of Automated Data Linkage to improve the quality of matching between PES and Census records.

**5** For more details on the PES, see Census of Population and Housing - Details of Undercount, 2011 (cat. no. 2940.0).

### Net undercount

**6** The PES estimate of the Aboriginal and Torres Strait Islander population at the time of the 2011 Census was 662,300 people. This compares with the Census count for Australia (excluding Other Territories) of 548,100 Aboriginal and Torres Strait Islander people. It is important to note that this Census count of Aboriginal and Torres Strait Islander people excludes people whose Indigenous status was unknown in the Census (see below). The Aboriginal and Torres Strait Islander net undercount (the difference between the PES Aboriginal and Torres Strait Islander population estimate and the actual Aboriginal and Torres Strait Islander population Census count) was 114,200 persons, 17.2% of the population.

### Unknown Indigenous status

**7** There were 1,059,000 Census records (4.9% of the total Census count) with unknown Indigenous status in the 2011 Census. Of these, 27.4% (or 1.3% of the total Census count) were a result of item non-response; that is, the ABS received a partially completed Census form for the person with the Indigenous status question unanswered. The remaining majority (72.6%) of records with unknown Indigenous status (3.5% of the total Census count) were a result of imputation by the ABS for people who were identified as resident in dwellings (both private and non-private) at the time of the Census but for whom no Census form was received. While some of the records with unknown Indigenous status will be for people

of Aboriginal and/or Torres Strait Islander origin and others for non-Indigenous people, no imputation was made for Indigenous status on the Census file. For a detailed discussion of unknown Indigenous status in the 2006 Census see Commentary: Interpreting The Data in the ABS publication Population Distribution, Aboriginal and Torres Strait Islander Australians, 2006 (cat. no. 4705.0). A discussion of unknown Indigenous status in the 2011 Census will be available in Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts Between 2006 and 2011 (cat. no. 2077.0), due for release on 17 September 2013.

**8** The PES estimated that of the 1,059,000 Census records with an unknown Indigenous status, about 28,400 were Aboriginal and/or Torres Strait Islander people.

## CALCULATING ESTIMATED RESIDENT POPULATION - FINAL

### Empirical Bayes method

**9** Given the relatively high standard errors for net undercount by Indigenous status by state, the ABS used the Empirical Bayes estimation method to estimate more reliable undercount inputs for use in deriving population estimates. The Empirical Bayes method takes the original PES undercount estimate (the ratio of the PES population estimate to the Census count) for each region and smooths this towards a prediction based on the Census characteristics of the region (specifically the proportion of Aboriginal and Torres Strait Islander persons and the level of Census non-response in the region).

**10** The Empirical Bayes method used for the 2011 estimates was largely the same as that used in 2006, except for some minor changes, including the use of 18 regions (up from 15 in 2006) to include a Northern Australia dimension.

**11** The overall amount of smoothing used in each region was determined by two factors: the standard error for each region and an overall smoothing constant. The smoothing constant was chosen using the 'method of moments' technique developed by Morris (1983). The aim of smoothing is to provide stable estimates with lower standard errors. Regions with high standard errors required more smoothing and hence received a greater proportion of the national PES estimate, while regions with lower standard errors received a greater proportion of their individual PES estimate. The outcome of this methodology, in relation to smaller standard errors and confidence intervals, is presented in the table and graphs below.

**Empirical Bayes Estimates and Standard Errors**

|                              | EB Population Estimate<br>no. | EB Undercount<br>no. | SE<br>no. | EB Undercount rate<br>% | SE<br>% |
|------------------------------|-------------------------------|----------------------|-----------|-------------------------|---------|
| New South Wales              | 205 762                       | 33 147               | 6 743     | 16                      | 2.7     |
| Victoria                     | 46 726                        | 8 739                | 2 115     | 19                      | 3.7     |
| Queensland                   | 187 223                       | 31 402               | 6 022     | 17                      | 2.7     |
| South Australia              | 37 096                        | 6 664                | 1 092     | 18                      | 2.4     |
| Western Australia            | 87 104                        | 17 440               | 2 673     | 20                      | 2.5     |
| Tasmania                     | 24 001                        | 4 381                | 832       | 18                      | 2.9     |
| Northern Territory           | 68 346                        | 11 561               | 1 849     | 17                      | 2.2     |
| Australian Capital Territory | 6 068                         | 884                  | 233       | 15                      | 3.2     |
| Australia                    | 662 326                       | 114 218              | 14 274    | 17                      | 1.8     |

**12** Estimates of the Aboriginal and Torres Strait Islander (and non-Indigenous) population were then adjusted to include Australian residents temporarily overseas at the time of the Census (9 August 2011) and backdated to the estimated resident population reference date of 30 June 2011 using data on births, deaths, and interstate and overseas migration. Estimates were also assumed for net undercount in Other Territories, which were added to the Census count of Aboriginal and Torres Strait Islander people identified as being usually resident in those territories. At the national level, this resulted in a net increase of 7,500 from the 2011 PES estimate of 662,300 Aboriginal and Torres Strait Islander people (excluding Other Territories) at 9 August 2011 to the final estimate of the resident Aboriginal and Torres Strait Islander population at 30 June 2011 of 669,900 (including Other Territories).

**13** The table below shows preliminary and final estimates as well as 2006 Census-based projections of the Aboriginal and Torres Strait Islander population, for 30 June 2011. For Australia, the final estimate is around 150 persons higher than the preliminary estimate (published on 27 September 2012 in Australian

### Aboriginal and Torres Strait Islander ERP, State/Territory, preliminary and final rebased - 30 June 2011

|                              | Aboriginal and Torres Strait Islander ERP |              |                   |       | Aboriginal and Torres Strait Islander population projections |                       |
|------------------------------|---|--------------|-------------------|-------|--|-----------------------|
|                              | Preliminary<br>no.                        | Final<br>no. | Difference<br>no. | %     | Low series(a)<br>no.   | High series(a)<br>no. |
| New South Wales              | 208 364                                   | 208 476      | 112               | 0.05  | 168 583  | 168 773               |
| Victoria                     | 47 327                                    | 47 333       | 6                 | 0.01  | 37 603   | 37 647                |
| Queensland                   | 188 892                                   | 188 954      | 62                | 0.03  | 164 694  | 164 883               |
| South Australia              | 37 392                                    | 37 408       | 16                | 0.04  | 31 005   | 31 040                |
| Western Australia            | 88 277                                    | 88 270       | -7                | -0.01 | 77 607   | 77 694                |
| Tasmania                     | 24 155                                    | 24 165       | 10                | 0.04  | 20 551   | 20 580                |
| Northern Territory           | 68 901                                    | 68 850       | -51               | -0.07 | 69 756   | 69 855                |
| Australian Capital Territory | 6 167                                     | 6 160        | -7                | -0.11 | 4 822  | 4 825                 |
| Australia(b)                 | 669 736                                   | 669 881      | 145               | 0.02  | 574 874  | 575 552               |

(a) Projected Aboriginal and Torres Strait Islander population at 30 June 2011, based on 2006 Census.

(b) Includes Other Territories.

**14** The final Aboriginal and Torres Strait Islander population estimate for 30 June 2011 (669,900 persons) was higher than the 9 August 2011 Census count (548,400 persons). This difference (22.2% or 121,500 people) represents the combined and net effects of Census net undercount (including people whose Indigenous status was unknown in the Census), residents temporarily overseas on Census night, demographic adjustments, and backdating to 30 June. The highest proportional increases from Census counts to final estimates were in WA (up 26.7%) and Victoria (up 24.6%).

#### Sub-state/territory Aboriginal and Torres Strait Islander estimates

**15** The PES is the best available data source for determining what the Aboriginal and Torres Strait Islander population should have been on Census night, if the complete population was counted. However, as standard errors on the PES are too high for reliable estimates of the Aboriginal and Torres Strait Islander population to be produced at sub-state/territory levels, Census is the only data source for calculating estimates of the Aboriginal and Torres Strait Islander population for geographic areas smaller than a state or territory.

**16** In producing estimates of the Aboriginal and Torres Strait Islander and non-Indigenous populations of Statistical Areas Level 2, PES estimates produced by the Empirical Bayes method for each state/territory were used as upper level constraints on the SA2-level Aboriginal and Torres Strait Islander populations as at Census night. State/territory net undercount was distributed pro-rata to individual SA2s, having regard to capital city/balance of state undercount for the total population according to their demographic characteristics such as age and sex.

**17** It is important to note that at the sub-state/territory level, differences between Census counts and estimates of the Aboriginal and Torres Strait Islander population should not be interpreted as a definitive measure of the actual level of undercount; rather, these differences are a by-product of the assumptions that contribute to the estimation process and the differences should be considered indicative, based on the best available (though limited) information.

#### Plans for further output

**18** A time series of Aboriginal and Torres Strait Islander population estimates and projections is scheduled for release in April 2014 in Estimates and Projections, Aboriginal and Torres Strait Islander Australians, 2001 to 2026 (cat. no. 3238.0).

#### FURTHER INFORMATION



**19** Related ABS publications and references that may be of interest to users of this product include:

- Australian Demographic Statistics (cat. no. 3101.0)
- Census of Population and Housing - Details of Undercount, 2011 (cat. no. 2940.0)
- Population Estimates: Concepts, Sources and Methods, 2009 (cat. no. 3228.0.55.001)
- Information Paper: Measuring Net Undercount in the 2011 Population Census, 2011 (cat. no. 2940.0.55.001)
- Occasional Paper: Population Issues, Indigenous Australians, 1996 (cat. no. 4708.0)
- Research Paper: An Estimating Equation Approach to Census Coverage Adjustment, May 2007 (cat. no. 1351.0.55.019)
- Census of Population and Housing: Understanding the Increase in Aboriginal and Torres Strait Islander Counts Between 2006 and 2011 (cat. no. 2077.0), due for release on September 17, 2013

## **Adjustment for age heaping in the Northern Territory Aboriginal and Torres Strait Islander population (Technical Note)**

### **TECHNICAL NOTE 2 ADJUSTMENT FOR AGE HEAPING IN THE NORTHERN TERRITORY ABORIGINAL AND TORRES STRAIT ISLANDER POPULATION**

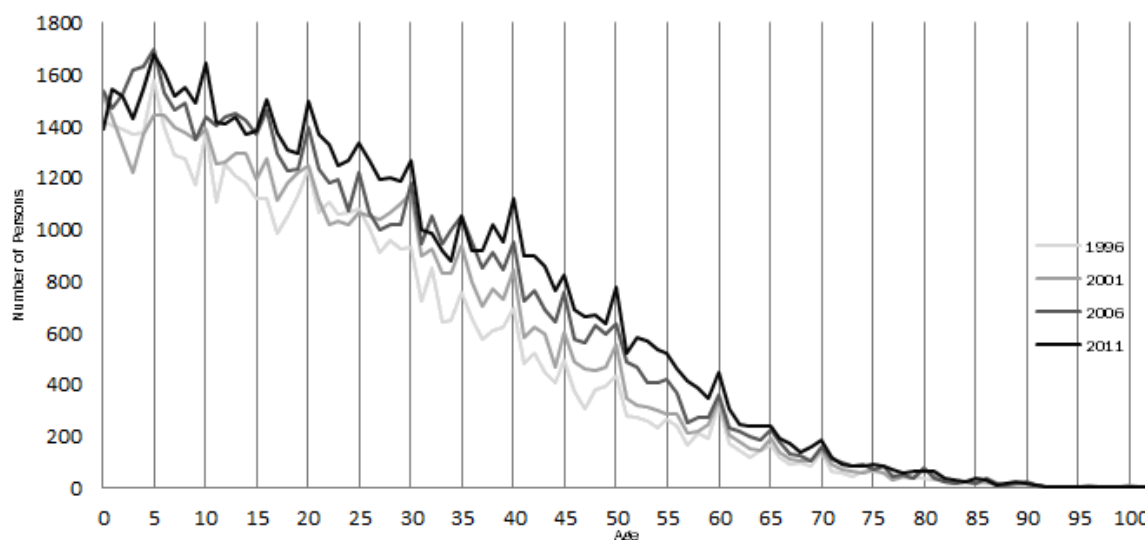
#### **INTRODUCTION**

**1** Age heaping describes the phenomenon of uneven population age distribution in Census or survey data. When age heaping occurs, data show systematic spikes on particular ages such as those ending in 0 or 5. This happens as a result of 'digit preference' or rounding when respondents are unsure of their age or the age of others they are reporting on behalf of. Age heaping is a relatively common demographic issue in developing countries and is generally not observed in the Australian population, except in the Northern Territory, where it is evident in Census counts and population estimates for the Aboriginal and Torres Strait Islander population.

**2** The purpose of this technical note is to present the findings from an investigation undertaken by the ABS to determine the occurrence and the extent of age heaping in the Aboriginal and Torres Strait Islander population in the Northern Territory. This technical note also presents data for this population that have been adjusted to reduce the distributional impact of age heaping.

#### **PRESENCE OF AGE HEAPING IN THE NORTHERN TERRITORY**

**3** The graph below shows the estimated Aboriginal and Torres Strait Islander population for the recent Census years in the Northern Territory. It shows some noticeable population spikes at ages ending in 0 and 5.



Source: ABS Unpublished Aboriginal and Torres Strait Islander population estimates as at 30 June 1996, 2001, 2006 and 2011.

4 While the ABS has not traditionally applied an adjustment for age heaping, the increasing demand for data by single year of age for key reporting and population projection purposes has necessitated a methodological response to ensure the best possible estimates by age for the Northern Territory.

## METHODOLOGY

5 Five methods were examined to adjust for age heaping in the Northern Territory Aboriginal and Torres Strait Islander population. While the Sprague method was considered the most robust, a brief discussion of each method is included below.

### Moving averages (3 year and 5 year) method

6 The 'Moving Averages' method involves calculating the average of the population in the three or five consecutive ages, and regards this average as the population at the central age of the 3 or 5 consecutive ages. The advantages of the method are that it is relatively easy to calculate and is commonly used. However, the method fails to maintain consistency with state-level totals published elsewhere, which makes it ineffective in the consideration of population estimates.

### Griffith Feeney method

7 The 'Griffith Feeney' method distributes the implausible number of people at ages ending in 0 and 5 to surrounding ages by linear interpolation using an established set of formulae (Feeney, 1979). The method has the relative advantage of maintaining state-level totals, but is resource-intensive and only gives the mid-point of the five-year age group. Age heaping is not effectively resolved at the single year of age.

### Estimates based directly on births

8 This method applies the age structure of the annual series of births in the cohorts corresponding to the Census age to the five-year age group total of the original population. The method maintains state totals, but requires a consistently complete set of birth registrations across at least 70 years, which is not currently available by Indigenous status.

### Estimates based on survivors of births

9 This method is similar to 'Estimates based directly on births', but incorporates deaths registrations to consider the impact of deaths on populations. The same advantages and disadvantages apply.

## Sprague method

**10** The 'Sprague' method involves applying a set of established multipliers (Judson & Popoff, 2004) to the population totals at the 5 year age group level. The method is easy to implement, uses available population data and maintains state level totals and age group sex ratios. For these reasons, the Sprague method was applied to adjust the age heaping in the Aboriginal and Torres Strait Islander population in the Northern Territory.

## STEPS TO CALCULATE THE ADJUSTED NORTHERN TERRITORY ABORIGINAL AND TORRES STRAIT ISLANDER POPULATION

**11** The Sprague method was applied as follows:

Step 1: The Sprague multipliers were applied to the five-year age group totals to estimate the population at each single-year age within that age group. This produced the adjusted total Aboriginal and Torres Strait Islander population by single year of age.

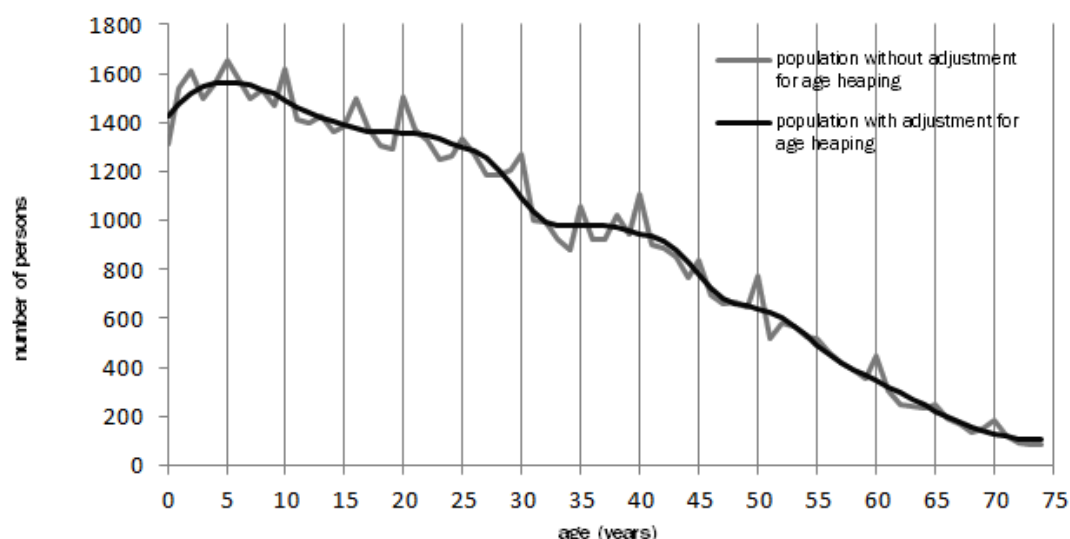
Step 2: The average proportion of Aboriginal and Torres Strait Islander males to the total Aboriginal and Torres Strait Islander population from the three most recent Censuses (2001, 2006 and 2011) was calculated for each age. This proportion was then applied to the single year of age totals calculated in Step 1 to obtain the male population at each age.

Step 3: The female population in each single year of age was then calculated by subtracting the adjusted male population (from Step 2) from the adjusted total Aboriginal and Torres Strait Islander population (from Step 1).

Step 4: The sex ratios (SRs) for each age were then compared with the average SRs for 2001, 2006 and 2011, to ensure that they were consistent.

Step 5: The adjusted population totals by five-year age groups for both male and female were compared with that of the unadjusted population. Very minor adjustments were made to the adjusted population to maintain age group totals and sex ratios for each age group.

### ABORIGINAL AND TORRES STRAIT ISLANDER POPULATION ESTIMATES, NORTHERN TERRITORY - 30 JUNE 2011



Source: Estimates of Aboriginal and Torres Strait Islander Australians - 30 June 2011 (cat. no. 3238.0.55.001)

## DATA ADJUSTED FOR AGE HEAPING

**12** The Northern Territory Aboriginal and Torres Strait Islander population estimates that have been adjusted for age heaping are provided in Datacube: Aboriginal and Torres Strait Islander population estimates (adjusted for age heaping), Northern Territory. This datacube is provided for reference purposes and includes original and adjusted estimates. To maintain the effective relationship between all population estimates (Aboriginal and Torres Strait Islander, non-Indigenous and total population) across all levels of

geography, the adjusted data have not been used in the official series. Consultation will occur ahead of the 2016 rebasing cycle to determine whether these adjustments should be applied in the official series.

**13** It is important to note that the ABS does not generally release Aboriginal and Torres Strait Islander population estimates by single year of age due to quality concerns. Users are advised to use the single year of age data provided here with caution. For most reporting and analysis purposes only, population estimates in five-year age groups is recommended.

## **DATA AVAILABLE ON REQUEST**

**14** The ABS will continue to use the unadjusted Aboriginal and Torres Strait Islander population estimates for publications and customised requests for consistency. Where users require age heaping-adjusted data, the method presented herein is available upon request.

## **REFERENCES**

**15** Judson, D. & Popoff, C. (2004) Selected General Methods in Siegel, J. & Swanson, D. (Eds), *The Methods and Materials of Demography*. Elsevier Academic Press: San Deigo.

**16** Feeney, G., (1979). A Technique for Correcting Age Distributions for Heaping on Multiples of Five, *Asian and Pacific Census Forum*, 5(3).